Enclosed Combustors Specification

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EQUIPMENT DESIGN AND SELECTION

Combustion of natural gas, vapors and other residual gases at oil well facilities, gas and liquid loading facilities, tank farms and process plants is necessary to maintain environmental quality, safety and for regulatory compliance.

Leed combustion systems are designed to operate at high efficiencies (>99%). Typical operating pressures for combustors range from 0 to 16 oz. /in2 and can combust gas volumes to over 160 mSCFD. Enclosed Combustors are not designed to handle pressures exceeding 16 oz. /in2 and the main combustor gas should not be supplied from a higher pressure source such as a separator or wellhead.

Refer to attached data sheet for specific design, fabrication and inspection requirements.

CONTROLS AND INSTRUMENTATION

Design Basis

All instrumentation and controls shall follow instrument design basis established for specific site. For applications with no site specific design basis NFPA 85/86 compliant BMS system and gas train systems shall be used.

Burner Management System

A Burner Management System (BMS) is a safety system that permits the safe start up, operation, and shut down of the combustor. The primary objectives of the BMS are personnel safety and equipment protection.

Flame monitoring equipment provides the controller with flame status of burner and/or igniter. Flame control module receives a signal and determines whether there is a flame. Flame status, other interlocks and inputs are used by the control logic to prevent burner start-up or initiate burner shutdown if preset operating conditions have not been verified.

Leed Fabrication offers a variety of BMS options in compliance with NFPA requirements. Contact one of our representatives for information and support selecting the right BMS for your application.

INSTALLATION

Carefully read and familiarize yourself with the content of the IOM manual and other equipment documentation before attempting to install, operate or service any equipment.

Site Selection and Preparation

A location for the combustor should be chosen that is an appropriate distance from any gas emission source as defined in your company's design practices. In the absence of company specific design practices, it is recommended that the combustor location is 75 – 100 feet from any source of fugitive emissions.

Shipping and Receiving

- When loading and off-loading the combustor and other ancillary equipment, make sure proper equipment and personnel is employed and adequate support and surface protection is provided to avoid both structural and superficial damage on the supplied equipment.

Installation Process

- Make sure all equipment drawings supplied with the unit are available prior to starting the installation process.
- Flat, stable ground should be chosen for setting the combustor. Concrete foundation or optional concrete pad provided with the combustor shall be used to make sure adequate support is available for the equipment.
- The combustor should be set with appropriate heavy lifting equipment and qualified personnel. The combustor base assembly is designed with lifting eyes located on the stack. Additional lifting lugs have been provided for off-loading and stabilization when setting the combustor.
- Before setting the stack, the insulation on the interior of the stack should be inspected. Remove any protective covering over the bird screen and air intake cells prior to setting the stack and thoroughly inspect the insulation. Any insulation damaged during transportation or storage shall be repaired or replaced.

- If the Burner Bracket Assembly is not already in place, align the outside angles on the burner bracket with the angles located inside the burner box. Slide the assembly until it is self-supported.
- The burner heads are installed on the couplings located on the Burner Bracket Assembly. The lower nozzle should be adjusted to locate ¼" below the inlet of the Venturi Mixer. To get more premix air, the nozzle can be adjusted to NO MORE THAN 3/8" from the entrance of the Venturi Mixer.
- Pilot Assembly is normally located on the burner plate. There is an alternate location for the pilot assembly on the side of the combustor stack. The assembly is easily accessible by sliding out the burner bracket or removing the plug in which the pilot assembly and igniter striker is mounted.
- Install ignition module and/or BMS system supplied with the unit. Please review attached manufacturer installation instructions before making any connections.
- If the inlet manifold is not already installed, proceed to install according to equipment drawings. Standard inlet manifold configuration shall include inline flame arrestor, block valve, gauges and other controls designed for the specific application.

Interface Connections

- Make sure all equipment interface drawings are available prior to starting the installation process.
- All piping should be designed and installed in accordance with regulations, recognized piping standards and company safety standards.
- The inlet piping to the combustor should be designed and installed to avoid liquid collection points, minimize pressure drop and freezing issues in field piping leading to the combustor. Installation of a Liquid Knock Out tank is strongly recommended.
- A block valve is located in front of the pilot regulator. Stainless steel tubing and fittings should be run from the pilot source gas to this valve. Care should be taken to avoid piping that may cause freezing or trip hazards.

- Install Electric supply to the ignition module and/or BMS system.
- Install any other instrumentation associated with the system. Refer to equipment drawings before making any connections.

INSPECTION

Recommended Inspection Schedule

Weekly Inspection:

- Inspect all connections and make sure that they are tight and no leaks exist in the system.
- Inspect air intake cells. High pressure air might be used to clean up the air intake cells prior to starting the unit.
- Confirm proper operation of the ignition system / BMS.

Quarterly Inspection:

- Confirm that thermocouples and all basic instrumentation (gauges, sight glasses, transmitters/switches, etc.) are in correct working order. Replace faulty items as required.
- Inspect and clean detonation/flame arrestors as required.
- Confirm set points on pilot fuel gas system and adjust as required.
- Confirm proper operation of the ignition system / BMS.

REQUIRED DOCUMENTATION

The following documentation is the minimum recommendation for the design, commissioning and operation of this type of unit.

1. Equipment Data Sheet
2. General Arrangement / Interface Drawing
3. Spare Part List
4. IOM Manual
5. BMS system Documentation Package